

WHAT IS CLAIMED IS:

1. A method of forming an insulating film comprising silicon oxide formed over a glass substrate,  
wherein the insulating film includes halogen at a concentration of  
5  $5 \times 10^{20} \text{ cm}^{-3}$  or less and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less which are detected by second ion mass spectroscopy.
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2. A method according to claim 1, wherein the halogen is fluorine or chlorine.
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3. A method according to claim 1, wherein the insulating film includes  
10 carbon at a concentration of  $1 \times 10^{18} \text{ cm}^{-3}$  or less which is detected by the second ion mass spectroscopy.
4. A method according to claim 1, wherein said insulating film is a gate insulating film.
5. A method according to claim 1 wherein the insulating film is an  
15 insulating film in a thin film transistor.
6. A method according to claim 1, wherein the insulating film covers an even surface over the glass substrate.
7. A method according to claim 1, wherein the insulating film includes halogen at a concentration of  $1 \times 10^{17} \text{ cm}^{-3}$  or more.
- 20 8. A method of producing a semiconductor device, said method comprising the steps of:

forming a crystalline semiconductor island formed over a glass substrate; and

forming an insulating film including silicon oxide formed to cover the crystalline semiconductor island,

5 wherein the insulating film includes halogen at a concentration of  $5 \times 10^{20} \text{ cm}^{-3}$  or less and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.

9. A method according to claim 8, wherein the concentrations of halogen and carbon are detected by secondary ion mass spectroscopy.

10. A method according to claim 8, wherein the halogen is fluorine or chlorine.

11. A method according to claim 8, wherein the insulating film is formed by plasma chemical vapor deposition using an organic silane.

12. A method according to claim 8, wherein the insulating film includes halogen at a concentration of  $1 \times 10^{17} \text{ cm}^{-3}$  or more.

13. A method of fabricating a thin film transistor, said method comprising the steps of:

forming a crystalline semiconductor island formed over a glass substrate;

forming a silicon oxide film formed to cover the crystalline semiconductor island; and

forming a conductive film including at least one of aluminum, titanium, and titanium nitride, said conductive film being formed on the silicon oxide film,

wherein the silicon oxide film includes halogen at a concentration of  $5 \times 10^{20} \text{ cm}^{-3}$  or less and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.

14. A method according to claim 13, wherein the halogen is fluorine or chlorine.

15. A method according to claim 13, wherein the silicon oxide film is formed by plasma chemical vapor deposition using an organic silane.

5 16. A method according to claim 13, wherein the silicon oxide film includes halogen at a concentration of  $1 \times 10^{17} \text{ cm}^{-3}$  or more.

17. A method of fabricating a thin film transistor, said method comprising the steps of:

10 forming a crystalline semiconductor island formed over a glass substrate;

forming a gate insulating film including silicon oxide formed on the crystalline semiconductor island; and

forming a gate electrode formed on the insulating film,  
15 wherein the gate insulating film includes halogen at a concentration of  $5 \times 10^{20} \text{ cm}^{-3}$  or less and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.

18. A method according to claim 17, wherein the halogen is fluorine or chlorine.

19. A method according to claim 17, wherein the gate insulating film is formed by plasma chemical vapor deposition using an organic silane.

20 20. A method according to claim 17, wherein the gate insulating film includes halogen at a concentration of  $1 \times 10^{17} \text{ cm}^{-3}$  or more.

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